

A Revision of the genus *Octotoma* (Coleoptera: Chrysomelidae, Hispinae)

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Abstract

The New World species of *Octotoma* are revised and keys, diagnoses, and descriptions are provided for the nine known species. The authorship of the genus belongs to Chevrolat rather than Dejean. *Octotoma intermedia*, from Mexico, is described as new.

Introduction

The name *Octotoma* was first published in Dejean (1837). In this catalogue there was no generic description, but the name was validated by the transfer of *Hispia plicatula* Fabricius to this new genus (Article 12 b (5) Internat. Code Zool. Nomen. 1985). Though authorship of the genus has often been attributed to Dejean, it actually belongs to Chevrolat. Dejean (1837), in the introduction, gave responsibility to Chevrolat for genera produced out of the old genus *Hispia* (Barber & Bridwell, 1940). One other worker has been credited with authorship of *Octotoma*, namely Suffrian (1868). Full citations are presented below.

Guérin-Méneville (1844) described *O. scabripennis* from Mexico. Suffrian (1868) described *O. gundlachii* from Cuba. Chapuis (1875) gave the first generic description. Horn (1883) described *O. marginicollis* from Arizona and redescribed *O. plicatula*. Baly (1885) described *O. championi* from Guatemala and redescribed *O. scabripennis* and *O. marginicollis*. Weise (1910) described *O. crassicornis* from Brazil and later described *O. brasiliensis* from the same country (Weise, 1921). Uhmman (1940) described *O. nigra* from Brazil and later described *O. variegata* from Brazil (Uhmman, 1954).

Octotoma is in the tribe Uroplatini (Weise, 1911a) which is characterized by having the last antennal segments very closely united and the antennae appearing as three- to eight-segmented. The tribe is represented by thirty-two genera. *Octotoma* is distinguished by the following combination of characters: antennae short, 8-segmented, ending in a club, segment I subglobular, II cylindrical, VII as wide as VIII; antennal club not longer than the four preceding segments combined.

There are three other species names connected with *Octotoma*: *O. tessellata* Maulik which is a synonym of *Physocoryna scabra* Guérin-Méneville (Uhmman, 1932); *O. daguerri* Pic which is now in *Uroplata* (Uhmman, 1938); and *O. germaini* Pic which is now in *Acritispa* (Staines, 1988).

The biology and life history of several *Octotoma* species have been fairly well studied. *Octotoma scabripennis* is the best studied species because of its wide use in the biological control of *Lantana* sp. (Verbenaceae). Other species are known to a lesser extent and several have been used, but unsuccessfully, against *Lantana* sp. The life history will be discussed further under each species.

There has been no comprehensive study of *Octotoma*. Uhmman (1927) presented a key to the described species. Uhmman (1950) discussed the distinguishing elytral sculpture and shape for seven species. Other characters used in distinguishing species have been the presence of metallic sheen on the elytra; the sculpture of the clypeus; and the thickness, length, and shape of the antennal segments. All of these characters have been re-examined as well as the male genitalia, I have found the latter not to be useful in determining species.

The species of *Octotoma* fall into two distinct groups called "typical" and "atypical" by Uhmman (1950). The "typical" species: *plicatula*, *scabripennis*, *gundlachii*, *marginicollis*, and *championi* have 10 ½ rows of punctures, well developed elytral carinae, and asymmetrical elytral sculpture. The "atypical" species: *brasiliensis*, *crassicornis*, *nigra*, and *variegata* have 8 ½ rows of punctures, recognizable elytral costae, symmetrical elytral sculpture, and are parallel-sided. Since many of the genera of Uroplatini are distinguished primarily by the antennal structure, all species should be retained in *Octotoma* for they are uniform in this regard.

In the "typical" species the elytral sculpture is almost impossible to describe. The various longitudinal and transverse carinae are highly variable in placement and degree of development among individuals of the same species. Uhmman (1950) attempted to describe the elytral sculpture by dividing

- 9(8). Antennal segment II longer than I, III longer than II; lateral margin of elytra distinctly bisinuate; head without median sulcus; south Texas to Panama . . . *championi* Baly
- 9'. Antennal segment I and II equal in length, III barely longer than II; lateral margin of elytra weakly bisinuate; eastern half of the United States; head with median sulcus *plicatula* (Fabricius)

Octotoma brasiliensis Weise

Octotoma brasiliensis Weise 1921:270 (Lectotype (here designated): Brasil, Schaum/ *brasiliensis* n. sp./ coll. Haag/ typus/ Weise det./ *Octotoma brasiliensis*, type/ syntype/ Coll. DEI, Eberswale (DEIC)). Uhmman 1927:135; Blackwelder 1946:29; Uhmman 1950:260; Papp 1953:93; Uhmman 1957:116; Gaedike & Döbler 1971:344.

Description: Body flat; black variegated with dark reddish-brown. **Head:** vertex micropunctate; median sulcus deep; antennae mostly light reddish-brown; segments I-II reddish; V-VI broader than preceding; front light reddish-brown; clypeus darker. **Pronotum:** covered with large, coarse punctures; lateral margins evenly curved; basal margin bisinuate; disc highly elevated; median callus present; anterior margin straight; surface between punctures micropunctate; pronotal length 0.6 mm. (n=1); width 0.9. **Scutellum:** yellowish; micropunctate; orbicular. **Elytra:** lateral margins dentate, expanded to apex; narrowed after humeri; dilated at apex; apical margins dentate; 8 rows deep, coarse punctures; tricostrate; costa I interrupted four times so that it forms five sections, one medially and two preceding and following; costa II interrupted three times, on basal fourth, just beyond middle, near apex; costa III entire, depressed in middle; puncture rows VII and VIII reduced to single row in middle; base reddish, remainder black with reddish markings; elytral length 3.1 mm; width 1.4. **Legs:** reddish; micropunctate. **Venter:** pro-, meso-, and metasterna punctate in middle, rugose at sides; abdominal sterna micropunctate, black in middle, reddish at sides. Total length 3.8 mm.

Discussion: Life history unknown. Immature stages undescribed. This species is most similar to *O. crassicornis*. It can be distinguished by the expanded elytral apices and elytral costa I being interrupted three times.

Larval hosts: Unknown.

Distribution: Brazil.

Specimens examined: **BRAZIL** (DEIC). Total: 1.

Octotoma crassicornis Weise

Figure 1

Octotoma crassicornis Weise 1910:146 (Lectotype (here designated): 28381/ Brasilien/ 244/ Typus/ J. Weise det./ *Octotoma crassicornis*/ 23/ Brasilien/ 2838/ Zool. Mus. Berlin/ Lectotype, *Octotoma crassicornis* Weise, det. CL Staines, Jr. Paralectotype: Typus/ J. Weise det./ Brasilien, 28381/ Zool. Mus. Berlin/ Paralectotype, *Octotoma crassicornis* Weise, det. CL Staines, Jr. (ZMHB)). Weise 1911a:31, 1911b:45; Uhmman 1927:136; Blackwelder 1946:729; Uhmman 1950:261; Papp 1953:93; Uhmman 1957:116.

Description: Body color yellowish-brown; head and pronotum lighter. **Head:** vertex micropunctate; median sulcus present, deep; antennae thick, segments I-II subequal, as long as wide; IV-VI transverse, decreasing in length, V-VI wider than IV. **Pronotum:** margined laterally, four clusters of dense, large punctures on disc; midline impunctate, rest with scattered large punctures; raised areas micropunctate; pronotal length 0.6-0.7 mm. (avg. 0.65, n=2); width 0.8-0.9 (avg. 0.85). **Elytra:** brown except for apical fifth which is yellow; almost parallel-sided; lateral margins dentate, most pronounced at exterior apical angles; four straight costae; costa I weakly developed at base, interrupted three times, section before and after middle, last section, the longest beginning at elytral declivity and ending before reaching apical margin, section behind middle curved; costa II interrupted four times, basal section longest, section two weak and low, section three in the gap between sections two and three of costa I, section four ends at elytral declivity, section five short, slightly curved; costa III short, most visible at humeri; IV fine, weak, interrupted once, strongest at apex; all costae united by transverse carinae, all raised sections of costae strongly produced; elytral length 2.5-2.7 mm (avg. 2.69); width 1.3. **Venter:** pro-, meso-, and metasterna black; metasternum punctate in middle; metasternum punctate; abdomen yellow. Total length 3.2-3.3 mm (avg. 3.25).

Discussion: Life history unknown. Immature stages undescribed. This species is most similar to *O.*

nigra. It can be distinguished by elytral costa I being interrupted four times, the costal sections being strongly produced, and the pronotum having depressions near the basal margin.

Larval hosts: Unknown.

Distribution: Brazil.

Specimens examined: **Brazil** (ZMHB). Bresil, Garaca, 2/IX/1884 (USNM). Total: 3.

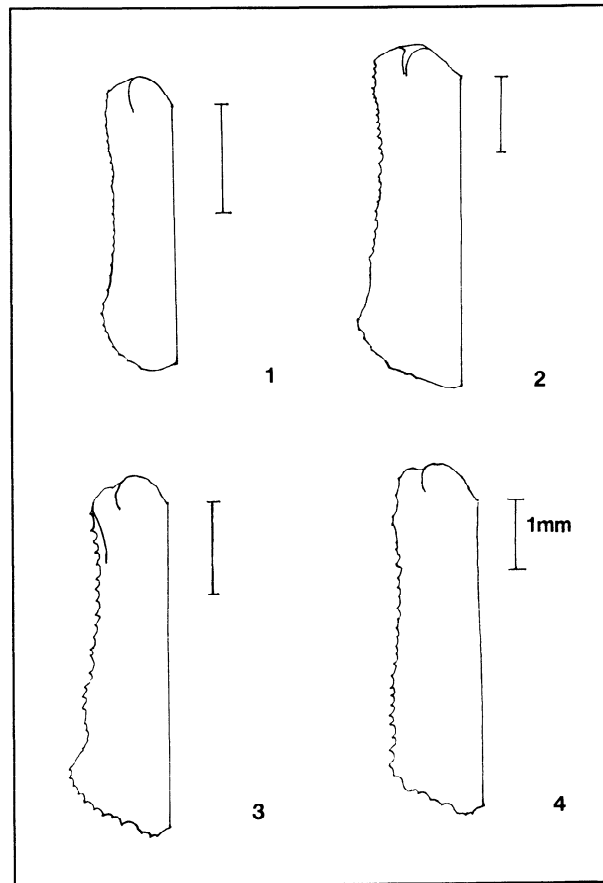
Octotoma nigra Uhmman

Octotoma nigra Uhmman 1940:454 (Holotype: Reed/ Bahia/ Holotypus/ *Octotoma nigra* Uh., Uhmman det. 38/ (BMNH). Paratype: Brasilia/ Paratypus (BMNH)). Blackwelder 1946:729; Uhmman 1950:260; Papp 1953:93; Uhmman 1957:116; Gaedike & Döbler 1971:355.

Description: Body black, parallel-sided. **Head:** black; vertex micropunctate; median sulcus present; two large punctures on either side of sulcus near eyes; antennae in pit; antennae light reddish-yellow; segment I punctate; II cylindrical, punctate, as long as I; III widens to apex, longer than II; IV-VI transverse, punctate; VII with rows of setae; VIII elliptical, with rows of setae, twice as long as VII. **Pronotum:** covered with large, coarse punctures; disc with longitudinal furrow; area between punctures micropunctate; basal area around disc depressed; basal margin sinuate; lateral margins weakly convergent; pronotal length 0.7 mm. (n=3); width 1.2. **Scutellum:** quadrate; reddish-brown. **Elytra:** eight rows of punctures; scutellar row of two punctures; rows VII & VIII united at middle; costa I interrupted in middle, more raised on apical half; II raised at base, in middle, and apex; III weak, most visible at apex; elytra narrows after humeri; apices individually rounded; lateral margin serrate; apical margin irregularly toothed; costae II & III united at apex; elytral length 3.8-4.1 mm (avg. 3.9); width 1.9.

Venter: pro- meso-, and metasterna black; abdomen yellow. **Legs:** reddish-brown. Total length 4.5-4.9 mm (avg. 4.7).

Discussion: Life history unknown. Immature stages undescribed. This species is most similar to *O. crassicornis*. It can be distinguished by elytral costa I being interrupted one time, the weak costae, and the lack of depressions near the base of the pronotum.



Figs. 1-4. Left elytron of *Octotoma* species. 1. *crassicornis*. 2. *marginicollis*. 3. *plicatula*. 4. *scabripennis*.

Larval hosts: Unknown.

Distribution: Brazil.

Specimens examined: **BRAZIL:** no further data (ZMHB). Bahia (BMNH); Brasilia (BMNH). Total: 3.

Octotoma variegata Uhmman

Octotoma variegata Uhmman 1954:499 (Holotype: 2683/ BRAZIL, Dr. G. Bondar/ Holotypus/ E. Uhmman det. 1952, *Octotoma variegata* Uh. (BMNH); type locality Bahia (Uhmman, 1954)). Gaedike & Döbler 1971:362.

Description: Body color reddish-brown with black markings, parallel-sided. **Head:** reddish-brown; median sulcus present; frons dark, transverse; row of punctures on inner margin of each eye; eyes

coarsely faceted; vertex micropunctate; antennae yellow-brown; segment I-II globular, subequal; III smaller, conical; IV-V conical, shorter than III; VI transverse; VII wider than VI, as long as II. **Pronotum:** twice as long as wide; covered with large, coarse punctures, except disc which is impunctate; lateral margins almost parallel anteriorly, weakly convex after middle; front angles acute; pronotal length 0.8 mm. (n=1); width 1.1. **Scutellum:** reddish-brown; quadrate. **Elytra:** with eight rows of punctures; with scutellar row of three punctures; narrows slightly after humeri; tricostate- I and III entire, II interrupted in middle, II and III united at apex, none strongly produced; lateral margin finely serrate; suture carinate; apical margin finely dentate; apices individually weakly rounded; elytral length 3.1 mm; width 1.5. **Venter:** dark. **Legs:** femur clavate. Total length 4.0 mm.

Discussion: Life history unknown. Immature stages undescribed. This species is most similar to *O. nigra*. It can be distinguished by elytral costa I being entire.

Larval hosts: Unknown.

Distribution: Known only from the type locality.

Specimens examined: BRAZIL (BMNH). Total: 1.

Octotoma championi Baly

Map 1

Octotoma championi Baly 1885:88 (type not seen; type locality Guatemala). Donckier 1899:571; Weise 1911a:31, 1911b:45, 1921:270; Uhmman 1927:135, 1934:274, 1937a:64; Maulik 1937:139; Blackwelder 1946:729; Uhmman 1949:25, 1950:266; Papp 1953:93; Uhmman 1957:116, 1961:20; Harley 1969:836; Wilcox 1975:144; Diatloff 1977:165; Julien 1982:50; Riley & Balsbaugh 1988:150.

Octotoma sp. probably *plicatula*: Krauss 1962:136, 1964:92.

Octotoma sp.: Fullaway 1958:73.

Description: Head and elytra black, pronotum reddish with black maculae. **Head:** vertex black; micropunctate; median sulcus absent; row of punctures along inner margin of each eye; front reddish; antennae divided by keel; clypeus punctate; antennae reddish; segment II transverse, longer than I; III cylindrical,

longer than II; IV-VI transverse; VIII elliptical, hirsute. **Pronotum:** reddish; anterior margin black; row of punctures on anterior margin; six black maculae, one on each lateral margin in middle, two transverse on anterior half, two large circular ones on posterior half; disc smooth, except for several large punctures; pronotal length 0.7-0.8 mm (avg. 0.7; n=15); width 1.3-1.4 (avg. 1.4). **Scutellum:** alutaceous, reddish-yellow, transverse. **Elytra:** black; carinae over entire surface; lateral margins dentate; apical margins more dentate; exterior apical margin with flattened lamina; elytral length 3.6-4.4 mm (avg. 3.9); width 1.7-2.0 (avg. 1.9). **Legs:** reddish; pro- and mesofemur with tooth, punctate; protibia flattened. **Venter:** alutaceous at sides. Total length 4.3-5.3 mm (avg. 4.7).

Discussion: Life history unknown. Larva and pupa described by Uhmman (1949). The larval mine is very narrow, with a very faint fecal trail. Pupation occurs in the mine near the starting point (Uhmman, 1937a). Adults feed on foliage by destroying the upper epidermis of leaves (Diatloff, 1977). This species is most similar to *O. plicatula*. It can be distinguished by antennal segment II being longer than segment I; elytral carinae sharper and more elevated; sinuation of lateral elytral margin anterior to apical margin more distinct; apical elytral angle more angular and more coarsely serrate; and the vertex of the head without a median sulcus.

Larval host plants: *Lantana camara* L., *L. hispida* H. B. & K., and *L. trifolia* L. (Diatloff, 1977). Diatloff (1977) tested feeding and oviposition of *O. championi* on 52 plant species in 27 families. Minor adult feeding was noted on *Mentha* sp., *Oreganum* sp. (Labitae), and *Sesamum* sp. (Pedaliaceae).

Distribution: South Texas to Panama.

Specimens examined: COSTA RICA: Cartago, 2/VII/1974 (USNM); San Jose (USNM); Turrialba, IX/1956 (HDOA). GUATEMALA: (USNM). HONDURAS: Sta. B, 13 km SE El Mochito, 16/VII/1977 (EGRC). MEXICO: DF (USNM). Chiapas- 25 mi S. Malpaso, 25/V/1969 (CNC). Colima- Vuleano (USNM); Vulkan (USNM). Morelos- Cuernavaca, V/1945, VIII/1955, IX/1955 (USNM). Nayarit- Tepic, 20-24/VII/1952 (UAIC). San Luis Potosi- 13 mi W. El Naranjo, 3200 ft., 30/VI/1965 (TAMU); El Salto de Agua, 28-30/VII/1960 (CNC). Tabasco- Campo Exp. CSAT, 20 km W. Cardenas, 22/VII/1980 (TAMU). Tamaulipas- Bacatoma, 7 km SSE Gomez Farias, 25-30/III/1978 (EGRC); Mun. Gomez Farias, La Florida, "Poza Azul", 2/IV/1987 (PRJC). Veracruz- Sn. Rafael, Jicaltepec (MCZC); Veracruz, 6/X/1962 (USNM). NICARAGUA: Jinotega- 9 mi SE Jinotega, 5100 ft., 15/VII/1974 (EGRC). PANAMA: Chiriqui- Las Lagunas, 4 km W Hato de Vulcan, 1360 m, 13/X/1975 (STRI). UNITED STATES: Texas: Cameron Co.- Brownsville, 12/V/1919 (USNM); 6 mi NW Brownsville on HWY

281, 6-7/X/1984; Sabal Palm Grove Sanct., 28-29/III/1986 (EGRC). Total 62.

Octotoma gundlachii Suffrian

Map 1

Octotoma gundlachii Suffrian 1868:234 (type not examined; type locality Cuba). Uhmman 1950:264, 1957:116; Wilcox 1975:144.

Octotoma gundlachi: Gemminger & Harold 1876:3610; Donckier 1899:571; Weise 1911a:31, 1911b:45; Leng & Mutchler 1914:458; Uhmman 1927:135, 1932:266; Blackwelder 1946:729; Papp 1953:93; Vaurie 1956:80; Fullaway 1958:73; Krauss 1962:136, 1964:92; Harley 1969:836; Bruner, et. al. 1975:185.

Description: Body color black with metallic sheen. **Head:** vertex alutaceous; row of punctures on inner margin of eye; median sulcus present; keel present between antennae, extended onto vertex; antennae reddish-brown, darker at apex; I-VI punctate. **Pronotum:** margins black, disc reddish-brown; covered with coarse, dense punctures; anterior margin prolonged into tooth on either side of head; pronotal length 0.7-0.9 mm (avg. 0.76, n=10); width 1.1-1.6 (avg. 1.4). **Scutellum:** black, alutaceous. **Elytra:** carinae over entire surface; lateral margin sparsely dentate; apical margin dentate; elytral length 3.6-4.3 mm (avg. 4.0); width 1.9-2.3 (avg. 2.1). **Legs:** black; femur punctate at apex, profemur with blunt tooth near apex on inner margin. **Venter:** black. Total length 4.3-5.1 mm (avg. 4.7).

Discussion: Life history unknown. Immature stages undescribed. This species was introduced into Hawaii as a biological control agent against *Lantana* sp., but has not become established (Krauss, 1962). It is similar to *O. championi*, *O. plicatula*, and *O. scabripennis*, and can be distinguished by the black pronotum, the metallic sheen of the body, and by its distribution.

Larval hosts: *Lantana* sp. (Vaurie, 1956).

Distribution: Cuba.

Specimens examined: CUBA: no further data (USNM); 14/IV/1953, IV/1953 (HDOA). Loma de Camoa, Habana, 14/III/1952 (CLS). Havana, IV/1952 (HDOA). Paro del Nedis, 2/VI/1933 (USNM). Soledad, 19/XI/1926 (USNM), 27/V/1925, V/1929 (MCZC), 16/XI/1926 (FSCA). Yateras Dist., Oriente, 1918 (USNM). Total: 27.

Octotoma intermedia, new species

Figure 5, Map 2

HOLOTYPE: Mexico: Tampaulipas Mun: Cd. Victoria, Canon La Libertad, 7/III/1986, P. Kovarik; ground trash./ **HOLOTYPE,** *Octotoma intermedia* Staines, det. C. L. Staines, Jr., 1987. (deposited in USNM). **PARATYPE:** Mexico: Tampaulipas, Mun. Gomez Farias, La Florida, "Poza Azul", 2/IV/1987, R. Jones/ **PARATYPES,** *Octotoma intermedia* Staines, det. CL Staines, Jr., 1987. (deposited in PRJC). **MEXICO:** Tampaulipas, Nacimiento del Rio Frio, 5 mi. S. Gomez Farias, 400ft., 5-6.vi 83, R. Anderson, tropical decid. forest/**PARATYPE,** *Octotoma intermedia* Staines, det. C.L. Staines, Jr., 1988. (deposited in I.S. Askevold collection).

Description: Body color yellow with brown markings. **Head:** vertex black at base, yellow between eyes; micropunctate; median sulcus present; front yellow; antennae yellow; segment II thick; III-V cylindrical, thinner than II, III longest; VI transverse; I-VI glabrous; VII-VIII hirsute. **Pronotum:** yellow with two black maculae; anterior margin with strong tooth on either side of head; lateral margins convergent to base; basal margin bisinuate; covered with large, coarse punctures, less so on disc; lateral margin with small lamina; pronotal length 0.6-0.7 mm (avg. 0.65, n=2); width 1.0-1.1 (avg. 1.0). **Scutellum:** yellow; quadrate; micropunctate. **Elytra:** yellow with brown markings; expanded to apex; exterior apical angles greatly expanded, scalloped; lateral margins dentate, more so at base, sinuate; carinae on apical half of elytra, most distinct in middle; sutural margin carinate; elytral length 2.9-3.0 mm (avg. 2.9); width 1.5-1.6 (avg. 1.5). **Legs:** tibiae widened to middle, narrowed to apex; base yellow, apex black, punctate on apical half; femur yellow at base and apex, dark in middle, punctate on apical half, micropunctate. **Venter:** prosternum micropunctate, yellow in center and sides, rest black; mesosternum black, micropunctate; metasternum black, punctate at sides; abdominal sterna dark medially, yellow at sides. Total length: 3.6 mm.

Etymology: Combination of inter= between and medius= middle, Latin; for the unifying character of the elytral sculpture.

Discussion: Life history unknown. Immature stages undescribed. This species is most similar to *O. marginicollis*. It can be distinguished by its smaller size and the expanded elytral apices.

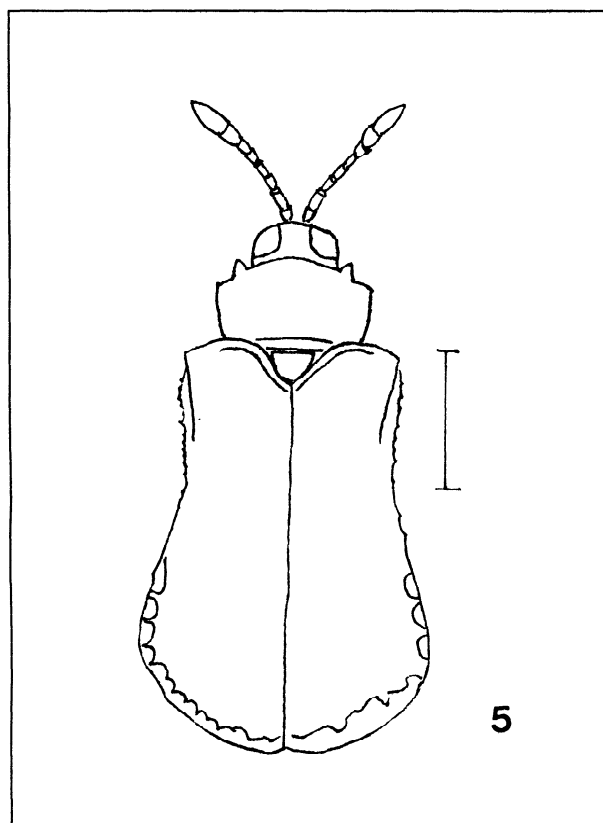


Fig. 5. Habitus of *Octotoma intermedia*, n.sp.

Larval hosts: Unknown.

Distribution: Tamaulipas, Mexico.

Specimens examined: **MEXICO**: Tamaulipas Mun: Cd. Victoria, Canon La Libertad, 7/III/1986 (USNM); Mun. Gomez Farias, La Florida, "Pozo Azul", 2/IV/1987 (PRJC); Nacimiento del Rio Frio, 5 mi. S. Gomez Farias, 400ft., 5-6/VI/1983 (Askevold). Total: 3.

Octotoma marginicollis Horn

Figure 2, Map 1

Octotoma marginicollis Horn 1883:300 (Lectotype: Ari[zona], type 3880, here designated; Paralectotypes- Ari[zona], Paratype (numbered 3880.2 through 3880.10), MCZC). Baly 1885:88; Champion 1894:240; Donckier 1899:571; Chittenden 1902:89; Weise 1911a:31, 1911b:45; Leng 1920:303; Weise 1921:270; Frost 1924:465; Jones & Brisley 1925:174; Uhmman 1927:136; Blackwelder 1946:729; Uhmman 1950:262; Papp

1953:93; Uhmman 1957:116; Gibson & Carrillo 1959:128; Wilcox 1975:144.

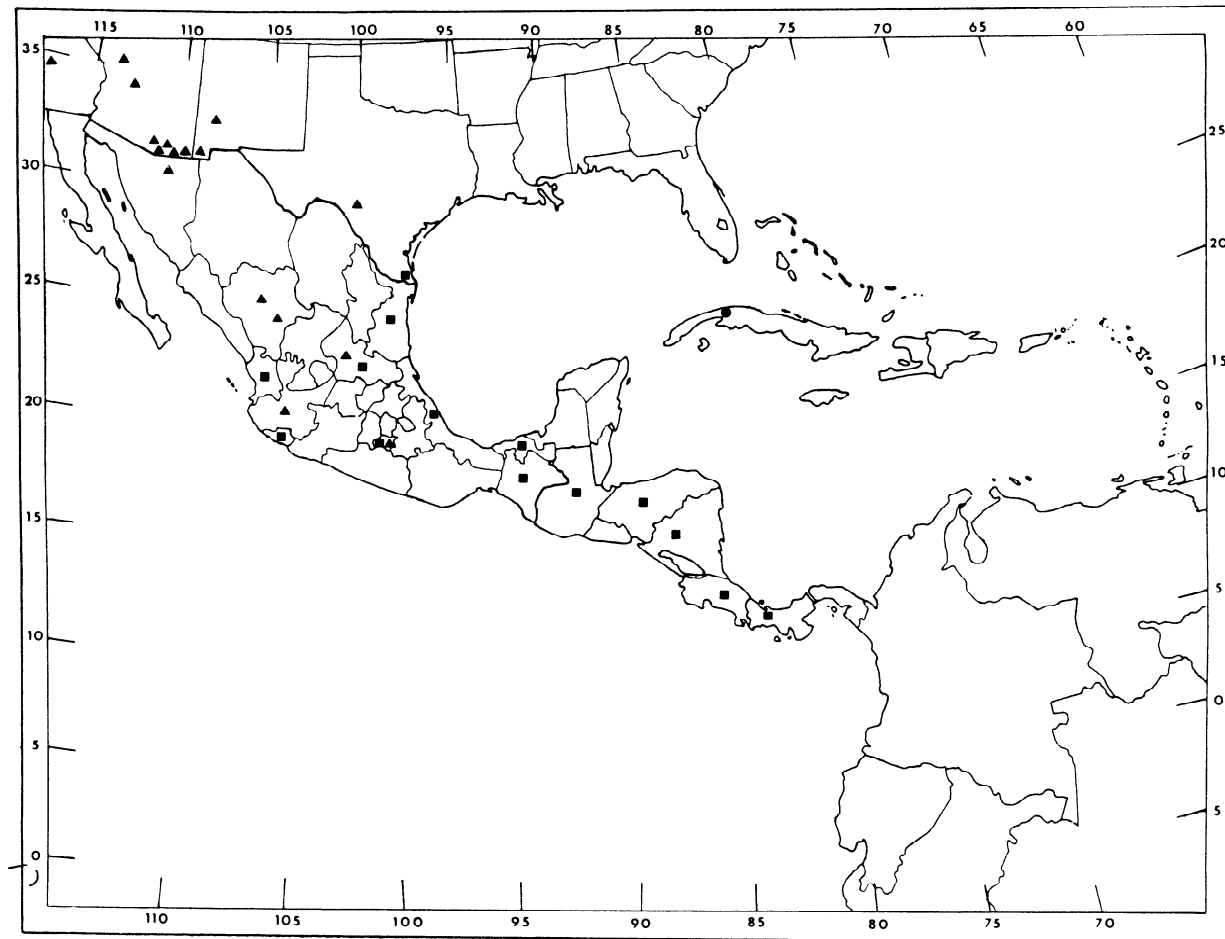
Description: Body color yellow with brown or black markings or black. **Head**: yellow; eyes dark; antennal segment II larger and wider than I, transverse; III cylindrical; median sulcus present; vertex micropunctate; row of parallel punctures on each side of sulcus; eyes coarsely faceted. **Pronotum**: posterior margin with deep pit on each side of midline; covered with coarse, dense punctures; completely margined; yellow with reddish-brown markings or entirely dark; length 0.7-1.1 mm (avg. 0.9; n=26); width 1.4- 1.7 (avg. 1.6). **Scutellum**: yellow; quadrate; micropunctate. **Elytra**: base yellow, apical half black or entirely dark; 10 rows of confused punctures at base plus scutellar row of 3 punctures; lateral and apical margins dentate; costa II distinctly raised from humerus to middle; apical half with carinae, difficult to follow puncture rows; apical margin flattened; apices individually rounded; length 4.0-5.0 mm (avg. 4.3); width 2.0-2.4 (avg. 2.2). **Legs**: tibia with tuft of setae on inner apical margin; femur clavate, punctured on apical two-thirds. **Venter**: prosternum reddish-brown anteriorly, black posteriorly; row of punctures along process, apex of process rugose; mesosternum medially transverse, punctate, rugose laterally; metasternum punctate, more dense laterally; abdominal sternae I-II punctate in middle, rest rugose; III rugose lateral anterior margin, with 3 rows of punctures; IV-V with 3 rows of punctures; VI with 4 rows of punctures. Total length 4.8-6.0 mm (avg. 5.3).

Discussion: Life history unknown. Immature stages undescribed. This species is most similar to *O. intermedia*. It can be distinguished by the elytral apices not being expanded and its larger size. It is variable in color, with a bicolored yellow and brown form and an entirely black form. The placement of the depressions and carinae on the elytra are quite variable.

Larval hosts: *Perezia thurberi* Gray (Compositae) (Jones & Brisley, 1925). Adults have been collected off *Fraxinus* sp. (Oleaceae) (Chittenden, 1902).

Distribution: Arizona, southern California, New Mexico, Texas, and Mexico.

Specimens examined: **MEXICO**: Serrino, Buena Vista, 6000 ft., Sierra del Carmen, Coah., 18/VII/1938 (TAMU). Durango- VII/1896 (USNM); 5 mi W. Durango, 1/VIII/1964 (CNC); 24 mi W. La Ciudad, 20/VI/1964 (CNC). Jalisco- mts N



Map 1. Distribution of *Octotoma* species: *championi* (squares); *gundlachii* (circles); *marginicollis* (triangles).

Ajijic, 16/VII/1964 (UAIC). Morelos- Cuernavaca, VI/1945, 17/VIII/1953, VI/1959, VII/1965 (USNM), VI (CASC). San Luis Potosi- Ciudad del Maiz, 3000 ft., 23/VIII/1954 (CNC). Sonora- 9 mi S Conanea, 16/IX/1970 (FSCA). **UNITED STATES:** **ARIZONA:** state label only (CUIC, MCZC); S. E. Ariz. (CUIC); Atascosa Mts., 2/X/1933 (CUIC); Ft. Grant, Pinaleno Mts., 15-19/VII/1917 (CUIC); Madero (MCZC); Morrison (MCZC, USNM). Pena Blanca, 14/IX/1947 (USNM). Cochise Co.- 4/VIII/1966 (PMNH); Bisbee, 5/VI/1915 (CASC); Cave Ck., 4/VII/1930 (CASC); Cave Ck. Cyn., 27/VI/1984 (CHAH); Cave Creek Cyn., Chiricahua Mts., Sunny Flat, 5100 Ft., 13/VI/1984; Chiricahua Mts., VII/1908 (CASC), 4/VII/1940 (SEMC), 26/VI/1984 (UAIC), 26/VII/1978, 23/VII/1984, 14/VII/1977 (EGRC), 28/IV/1968 (FSCA); Copper Canyon, 31/VII/1979 (CHAH); Douglas (USNM), Douglas, 24/VIII/1938 (USNM); Huachuca Mts., no further data (MCZC), 4/VII/1907 (USNM),

VI (USNM), 15/V/1937 (CNC), 14/VI/1926 (CNC), VII/1936 (CASC), 9/VII/1940 (SEMC), 14/VI/1928 (MCZC); Huachuca Mts., Carr Can., 5000 ft., 4/VI/1986 (USNM), 15/VII/1932 (CASC); Garden Can., 23/VI/1950 (CNC); Miller Cyn., 19/VII/1987 (CLS); Sawmill Can., 22/VI/1986 (USNM); Palmerlee, VI (USNM), 19/VII/1987 (CLS); 2 mi. SW Portal, 5000 ft., 31/V/1973 (CHAH), 4 mi SW Portal, 20/VII/1963 (CNC), 3 mi W Portal, 15/VIII/1979 (CHAH), 4 mi SE Portal, 4/VIII/1959 (CUIC); Ramsey Can., 15-19/VII/1912 (CASC), 15/VII/1969 (CUIC), 30/X/1937 (USNM), IX/1968 (CNC); Rustler Park, Chiricahua Mts., 22/VI/1967 (CDFA), 7/VII/1908, 27/VII/1908 (MCZC); Southwest Res. Sta., 5 mi W Portal, 18/IX/1966 (CASC). Coconino Co.- Grand Can., 11/VII/1912 (USNM); Williams, 8/VII (USNM). Gila Co.- Pine Creek, Globe, 8/VI/1953 (CUIC). Graham Co.- Hospital Flat, 2/VIII/1965 (CASC). Greenlee Co.- Clifton, 29/VII/1946 (USNM). Pima Co.- Catalina



Map 2. Distribution of *Octotoma* species: *scabripennis* (squares); *intermedia* (circles).

Mts., 22/VII/1942, 15/VI/1933 (CASC); Josephine Can., 4/VII/1972 (USNM); Mt. Lemon, 17/VI/1912 (CASC); Madera Cyn., 22/IX/1977 (OSUC); Marshall's Gulch, VI/1912 (CASC); Santa Rita Mts., 13/VI/1965 (CUIC), VII/1907 (MCZC), VI (UADE). Santa Cruz Co.- Rt. 289 11.5 mi SE Arivaca, 25/IX/1968 (CASC); Coronado Nat. For., 7 mi NNW Patagonia, 26/IV/1979 (CNC); 2.5 mi W Harshaw, 2/VIII/1952 (CASC); Madera Canyon, numerous 19/V- 25/X (CDFA, CHAH, CNC, CUIC, CASC, EGRC, FSCA, UAIC, USNM); Nogales, 10/VII/1949 (USNM), 22/VI/1941 (USNM), 11/VII/1919 (CASC), 25/IX/1968 (CASC); Patagonia, 3/XI/1968 (FSCA); St. Rita Mts., numerous 25/IV-22/X (CNC, CASC, SEMC, USNM); Stone Cabin, 25/VIII/1913 (USNM); Sycamore Canyon, 24/IX/1968 (CASC); Yank's Spring, 27/VII/1965 (CASC). Yavapai Co.- Prescott (USNM), 19/VI/1959 (CNC). CALIFORNIA: Riverside Co.- Anza, 12/VII/1941 (SEMC). NEW MEXICO: no further data (SEMC, USNM); Walnut Cr. (MCZC). Grant Co.- Pinos Altos Mts., 8/VIII/1951 (CASC); Silver City,

VII/1913 (CNC,MCZC). Hidalgo Co.- 2 mi N Rodeo, 8/VIII/1968 (FSCA). TEXAS: Bexar Co.- San Antonio, 8/IV/1907 (USNM). Uvalde Co.- Uvalde, 6/VIII/1933 (TAMU). Total: 1285.

Octotoma plicatula (Fabricius)

Figure 3, Map 3

Hispa plicatula Fabricius 1801:63 (type not examined; type locality Carolina). Olivier 1808:776; Guérin-Méneville 1844:279.

Microrhopala plicatula: Crotch 1873:83.

Octotoma plicatula: Dejean 1837:390; Melsheimer

1853:119; Gemminger & Harold 1876:3610; Horn 1883:300; Donckier 1899:572; Schwarz 1890:232; Chittenden 1902:88; Ulke 1902:29, 52; Blatchley 1910:1225; Weise 1911a:31, 1911b:45; Leng 1920:303; Dozier 1922:123; Frost 1924:464; Blatchley 1924:44; Uhmman 1927:135; Maulik 1937:139; Brimley 1938:230; Loding 1945:136; Uhmman 1950:266; Papp 1953:93; Wilcox 1954:473; Monrós & Bechyné 1956:1135; Uhmman 1957:116; Krauss 1962:136; 1964:92; Harley 1969:836; Kirk 1969:98, 1970:95; Balsbaugh & Hays 1972:187; Wilcox 1975:144, 1979:8, 14; Riley & Enns 1979:80; Ford & Cavey 1985:53; Lago & Mann 1987:6.

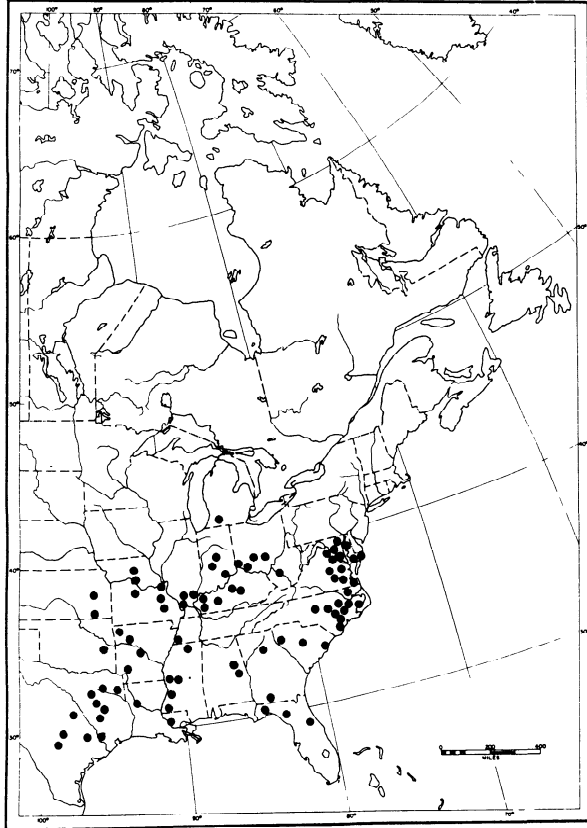
Description: **Head:** vertex black, alutaceous; median sulcus present; front testaceous; two rows of punctures along inner margin of eye; antennae separated by keel; antennae 8-segmented, testaceous; segment I thick; II cylindrical, equal to II; III barely longer than II; III-VI transverse; VII hirsute; VIII rounded, hirsute. **Pronotum:** reddish; six black maculae present, one on each lateral margin beginning in middle and continuing to base, two transverse spots on apical third, two large spots in depressions on basal margin; punctures deep, coarse; pronotal length 0.6-0.9 mm. (avg. 0.7; n=35); width 1.0-1.3 (avg. 1.1). **Scutellum:** testaceous; alutaceous; transverse. **Elytra:** black; carinae over entire surface; lateral and apical margins dentate; 8 rows of punctures visible at base, row I visible to apex; parallel-sided for basal half, then divergent, dilated at apex; apical margin flattened and expanded; elytral length 3.3-4.0 mm (avg. 3.6); width 1.4-2.0 (avg. 1.7). **Legs:** trochanter testaceous; femur base and apex testaceous, remainder darker, alutaceous, series of elongate punctures near apex; tibia dark reddish-brown, with large punctures on exterior margin, with rows of setae on inner margin, setose at apex; protibia with small tooth. **Venter:** black, except apical half of prosternum; prosternum alutaceous, basal half punctate; mesosternum punctate in center, alutaceous at sides; metasternum alutaceous, basal margin rugose in center, center punctate; abdominal sterna alutaceous in middle, rugose at sides. Total length 3.8-4.8 mm (avg. 4.3).

Discussion: This species forms tentiform mines. Excrement is accumulated as a black spot near the base of the leaf. Pupation occurs in the mine near the midrib. Adults make oblong holes in leaves. The larva was described by Ford & Cavey (1985). This species is most similar to *O. championi* and can be distinguished by antennal segments I and II being subequal in length, elytral carinae less sharp and less elevated, sinuation of lateral elytral margin less distinct, apical elytral angle less angular and more finely serrate, and the vertex of the head with a median sulcus.

Larval hosts: *Campsis radicans* L. (Bignoniaceae) and *Lespedeza* sp. (Leguminosae) (Wilcox, 1979). Adult feeding has also been recorded on *Aesculus* sp. (Hippocastanaceae), *Fraxinus* sp., *Ligustrum* sp., and *Chionanthus virginica* L. (Oleaceae) (Blatchley, 1924; Kirk, 1969). Lago & Mann (1987) reported adults from *Daucus carota* L. (Apiaceae) flowers.

Distribution: Maryland and Delaware west to southern Michigan and south to Texas.

Specimens examined: **UNITED STATES: ALABAMA:** Lee Co.- Auburn, 28/IV/1963, 5/V/1963 (AUEM). Tallapoosa Co.- Horseshoe Bend Natl. Park, 25/VI/1964 (AUEM). **ARKANSAS:** Faulkner Co.- Mayflower, VIII/1975 (UADE). Hempstead Co.- no locality, 29/V/1922 (UADE). Johnson Co.- no locality, 6/VII/1972 (UADE). Washington Co.- no locality, 10/VII/1952; Fayetteville (UADE). **DISTRICT OF COLUMBIA:** no data; V/1918 (CASC), 3/VII, 25/VII/1922 (USNM). **FLORIDA:** no further data (FSCA). Alachua Co.- Gainesville, 24/V/1967, 13/VI/1967, 23/VI/1984, 25/VII/1984, 1959 (FSCA). Leon Co.- no locality, 7/VIII/1984 (FSCA). Seminole Co.- Sanford, 5/III/1927 (CNC). **GEORGIA:** Clarke Co.- Athens, 23/V/1972, 14/V/1975, 8-14/V/1976, 4/V/1984 (UGCA); Whitehall Forest, 21/V/1976 (FSCA). Thomas Co.- Thomasville, 29/III/1938 (UGCA). **ILLINOIS:** state label only (MCZC). Jackson Co.- Carbondale, 27/IV/1908 (USNM). Pulaski Co.- Pulaski, 15/VII/1948. Union Co.- Pine Hills, 11/V/1960 (CNC). **INDIANA:** state label only (CASC,USNM); Hovey, 23/V/1964 (FSCA). Brown Co.- no locality, 25/V/1985, 16/VI/1982 (FSCA). Clarke Co.- Henryville, 25/V/1963 (FSCA). Marion Co.- Indianapolis, 30/V/1963, 28/VII/1975 (FSCA). Monroe Co.- Bloomington, 9/V/1962 (FSCA). Ripley Co.- Versailles, 30/V/1951 (CASC). **KANSAS:** Douglas Co.- Kaw River, 6/V/1979 (SEMC). Labette Co.- Oswego, 14/V/1966 (USNM). **KENTUCKY:** Bullitt Co.- Berheim Forest, 9/VII/1978 (EGRC). Christian Co.- Hopkinsville, 7/VI/1963 (CNC). Daviess Co.- Owensboro, 24/IX/1976 (CDFA). Madison Co.- Richmond, 2/V/1964, 17/V/1964 (CNC). Ohio Co.- 18/VI/1961 (CNC). **LOUISIANA:** Forbing, 24/III/1908 (USNM). Baton Rouge Par.- Baton Rouge, 10/III/1985, 8/III/1984 (EGRC). Natchitoches Par.- Campti, 22/VII/1978 (OSUC). **MARYLAND:** Glymont, 25/V (MCZC). Anne Arundel Co.- Annapolis, 9/IX/1987 (CLS); Chesapeake Beach, 2/VIII/1923 (USNM); Fort Smallwood, 7/V/1980 (JFC); Mayo Beach, 30/VIII/1944 (USNM). Baltimore Co.- Edgemere, 23/VI/1983 (JFC). Kent Co.- Chesterville, 27/VII/1976 (CLS); Langford, 18/VI/1983 (EJF). Montgomery Co.- Cabin John, 31/VIII/1982 (EJF); Great Falls, 21/VI/1912 (USNM), 31/VIII/1982 (JFC); Marshall Hall, 20/IV/1896 (USNM); Plummors Island, numerous 24/IV- 19/IX (CASC,USNM). Prince George's Co.- Brandywine, 31/VIII/1987 (CLS); College Park, 19/V/1969 (USNM); Fort Washington (USNM). St. Mary's Co.- Patuxent Naval Air Stn., 10/VI/1976 (EJF); Scotland, 18/IX/1986 (CLS). Somerset Co.- Hopewell, 17/VII/1983; Marion, 15/VI/1977; Pokomoke, 16/VII/1982; Shelltown, 16/VIII/1982 (JFC); Ward, 14/VII/1976 (EJF). Talbot Co.- Easton, 18/VIII/1982 (JFC), 19/VII/1982 (EJF). Worcester Co.- Bishopville, 1/IX/1987 (CLS); Milburn Landing, 4/VIII/1983 (JFC), 26/V/1984 (CLS). **MICHIGAN:** Kalamazoo Co.- Portage, 19/VII/1975 (EGRC). **MISSISSIPPI:** Adams Co.- Natchez, 23/VII/1921 (CASC,USNM). Lafayette Co.- Oxford, 3/V/1949 (FSCA). Madison Co.- Canton, 18/VIII/1960 (CNC). Sharkey Co.- Delta N. F., 8015, 6.4 km E of Rolling Fork, 1/X/1980 (CNC). Wilkinson Co.- Woodville, 7/VI/1921 (CASC). **MISSOURI:** Boone Co.- 8/IX/1975 (EGRC). Cole Co.- Jefferson City, 17/V (USNM). Jefferson Co.- Arnold, 16/VII/1975 (EGRC). Randolph Co.- 1 mi E Moberly, 23/VI/1974, 26/VI/1972, 22/VI/1972, 11/VI/1972, 30/IV/1974 (EGRC). St. Francis Co.- St. Francis St. Pk., 21/VI/1978 (EGRC). St. Louis Co.- St. Louis, 19/V (USNM). **NORTH CAROLINA:** state label only (CASC); 26/V/1952, 17/V/1961; Morrow Mt., 21/VII/1959 (NCSU). Duplin Co.- Faison, 4/X/1963 (NCSU). Durham Co.- Duke Forest, 1/VII/1973 (PMNH). Edgecomb Co.- 24/VI/1927 (EDNC). Gates Co.- VIII/1963 (NCSU). Hyde Co.- Swan Quarter, 2/V/1952 (FSCA). Johnston Co.- 1/X/1959 (NCSU). Lenior Co.- Kinston, 11/VIII/1960 (NCSU). Martin Co.- Williamston, 19/IV/1960 (NCSU). Pender Co.- Willard, 16/V/1958, 22/VIII/1957 (NCSU). Wake Co.- Cary, 22/IV/1974 (NCSU);



Map 3. Distribution of *Octotoma plicatula*.

Raleigh, 13/V/1951, 2/VII/1982, 15/X/1968 (NCSU), V/1922, IX/1924, 21/VIII/1903, 16/VII/19212, 28/VI/1933 (EDNC), 5/VII/1950 (CNC), 21/V/1952 (FSCA). **OHIO:** state label only (CASC). Clinton Co.- no locality, 16/VI/1961 (FSCA). Hamilton Co.- Cincinnati, VI/1913 (USNM), 14/VI/1922 (MCZC). Highland Co.- no locality, 16/VII/1961 (FSCA). Hocking Co.- no locality, 17/VI/1961 (FSCA). **OKLAHOMA:** Latimer Co.- no locality, VII/1985 (FSCA); 5 mi W Red Oak, 2/VII/1977 (FSCA). **SOUTH CAROLINA:** Anderson Co.- Anderson, 20/VIII/1939 (USNM). Clarendon Co.- Summerton, 23/VI/1984 (EJF,JFC). Horry Co.- 5 mi W. Myrtle Beach, 15/VIII/1980 (CNC). **TENNESSEE:** Shelby Co.- Memphis (USNM). Smith Co.- Elmwood (CASC). **TEXAS:** state label only (MCZC). Belfrage (MCZC). Anderson Co.- 10/IV/1960 (TAMU). Brazos Co.- College Station, 4/VII/1932 (TAMU); Hwy 30, Navasota R., 28/III/1969 (TAMU). Colorado Co.- 20/VII/1959 (TAMU); Columbus, 23-25/V (USNM), 24/V (SEMC), 25/V (MCZC). Gonzales Co.- Palmetto St. Pk., Ottine, 21/IX/1979 (TAMU). Harris Co.- Houston, 1892 (USNM), 1886 (MCZC). Harrison Co.- Marshall, 25/III/1907 (USNM). Karnes Co.- 23/VII/1928 (SEMC). Marion Co.- Jefferson, 27/III/1908 (USNM). Polk Co.- Ace, Menard Creek, 4 mi N. Romayor, 22/VI/1984 (TAMU). Victoria Co.- Victoria, 23/III (USNM). Wharton Co.- Wharton, 9/V/1905 (USNM). **VIRGINIA:** state label only (CASC,MCZC); Mathias Pt., V/1922 (MCZC); Potomac Cr., 23/V (MCZC). Arlington Co.- Turkey Run, 21/VII/1983 (JFC). Caroline Co.- Milford, 4/VII/1915 (USNM). Chesapeake Co.- Virginia Beach (USNM). Chesterfield Co.- Richmond (USNM). Fairfax Co.- 20/VI/1912; Chain Bridge, 11/IX/1921 (USNM). Spotsylvania Co.- Fredericksburg, 28/IX/1891 (MCZC). **WEST VIRGINIA:** state label only (USNM). Kanawha Co.- Kanawha Stn., 29/VII/1919 (USNM). Total: 593.

Octotoma scabripennis Guérin-Méneville

Figure 4, Map 2

Octotoma scabripennis Guérin-Méneville 1844:279 (type not examined; type locality Mexico). Gemminger & Harold 1876:3610; Baly 1885:87; Champion 1894:240; Donckier 1899:572; Weise 1911a:31, 1911b:45; Perkins & Swezey 1924:50; Swezey 1925:376; Uhmman 1927:136; Blackwelder 1946:729; Uhmman 1950:265; Papp 1953:93; Uhmman 1957:117; Weber 1956:164; Fullaway 1958:73; Gibson & Carrillo 1959:128; Krauss 1962:136, 1964:93; Davis & Krauss 1965:89, 1966:204; Uhmman 1966:273; Harley 1969:835; Davis 1972:189; Harley 1973a:8, 1973b:25; Andres 1973:20; Greathead 1973:90; Yadav & Pillai 1974:75; Wilcox 1975:144; Habeck 1976:18; Cilliers 1977:343; Clausen 1978:405; Forno & Harley 1979:152; Kamath 1979:68; Harley, et. al. 1979:65; Scheibelreiter 1980:102; Julien 1982:50; Cilliers 1983:137.

Description: Head and elytra black; pronotum red with black maculae. **Head:** vertex black, alutaceous; median sulcus faint; several large punctures near eyes; front reddish; clypeus reddish, coarsely punctate; antennae divided by keel; segment II transverse; III cylindrical, longer than II; IV-VI transverse; VIII elliptical, hirsute, longer than III; I-VII with some setae. **Pronotum:** reddish with six black maculae, one on each lateral margin at middle, two transverse spots on anterior half on either side of longitudinal carina, two large spots on posterior half on either side of longitudinal carina; covered with large, coarse punctures; basal margin bisinuate; front angles acute; pronotal length 0.8-1.1 mm. (avg. 0.9; n = 36); width 1.3-1.7 (avg. 1.5). **Scutellum:** yellowish-red; transverse; micropunctate. **Elytra:** black; carinae over entire surface; lateral and apical margins dentate; gradually expanding to apex; apical margin flattened; lateral margin more flattened apically; elytral length 4.2-5.5 mm (avg. 4.9); width 2.0-2.3 (avg. 2.1). **Legs:** pro- and mesofemura with tooth, femur reddish at base and apex, black in middle, with coarse punctures at apex, rugose; tibia expands to apex, protibia flattened apically. **Venter:** black; rugose at sides. Total length 5.1-6.4 mm (avg. 5.8).

Discussion: Immature stages undescribed. Life history was investigated by Harley (1969). This species has been widely released as a biological control agent (Julien, 1982). This species is similar to both *O.*

championi and *O. plicatula*. It can be distinguished by the lack of an expanded lamina at the elytral apices.

Larval hosts: *Lantana* spp. (Perkins & Swezey, 1924). Harley (1969) noted adult feeding on *Tectona grandis* L., *Lippia umbellata* (Verbenaceae), *Oreganum* sp., *Mentha spicata* L., *Salvia occidentalis* (Labiatae), *Sesamum indicum* L. (Pedaliaceae), *Vigna unguiculata* (L.) Walp., *Phaseolus vulagris* L., and *Stizolobium aterrimum* (Fabaceae).

Distribution: Central America.

Specimens examined: **EL SALVADOR:** San Salvador, X/1965 (USNM), 1953 (TAMU); Usulután, 4/VIII/1964 (TAMU). **GUATEMALA:** Sacapulas, 1500 m, 12/VIII/1947 (USNM). **HONDURAS:** Olancho- 5 mi SE Catacamas, 13/VI/1974, 11 mi NE Catacamas, 1200 ft., 15/VI/1974 (EGRC). **MEXICO:** no further data (MCZC,USNM). Chiapas- 10 mi N Chiapa de Corzo, 12/VII/1955 (SEMC); El Ocotol, 13/VIII/1969 (CNC); Oaxaco border, 21 km W Rizo de Oro, 1615 m, 6-8/X/1972 (CASC). Chihuahua- Sierra Madre Mts, La Bufa, 900 m, 7/VII/1972 (CASC). Colima- 10 mi NE Comala, 17-19/VIII/1983 (TAMU); Vulcano (USNM). Durango- 24 mi W La Ciudad, 15/VI/1964 (CNC). Guanajuato- no further data (MCZC); Salamanca, 4 mi S, 16/VII/1974 (FSCA). Guerrero-Hwy 134, 34-36 km NE Jct. 200, 14-16/VII/1985 (EGRC); 10.3 mi S Iguala, 23/VII/1981 (TAMU). Hidalgo- Minera Autlan, 7/V/1983, at light (EGRC). Jalisco- Ajijic, 16-18/VII/1966 (USNM); mts N Ajijic, 5400 ft., 20/VI/1964 (UAIC); 6.7 mi N Autlan, 7/VII/1984 (TAMU); Chapala, 17/VII/1966 (EGRC); 6 mi W Chapala, 30/VI/1963 (CNC); 6 mi E Lagos de Morino, 29/VII/1978 (TAMU), 15.5 mi NE Lagos de Morino, 6200 ft., 26/VII/1952 (SEMC); 12 mi W Plan de Barrancas, 25/VII/1966 (TAMU); 5.5 mi NE Tecolotlan, 13/VII/1982 (CDFA); Hwy 80, 10 mi NE Tecolotlan, 5400 ft., 11/VIII/1982 (EGRC). Michoacan- 7 mi. W Sahwazo, 21/VII/1965 (OSUC); Uruapan, VII/1912 (CASC). Morelos- Cuernavaca, V/1945, VI/1945, VII/1953, VI/1959 (USNM), VI (MCZC), 1902 (CASC), 5/IX/1982 (EGRC); Morelos, IX (CASC). Nayarit- 12.3 mi W Compostela, 7/VII/1982 (CDFA). Oaxaca- no further data (MCZC). 2 mi N Miahuatlan, 14/VII/1973 (TAMU); 14 mi N Miahuatlan, 16/VII/1974 (TAMU); Oaxaca, 18/VII/1987; Oaxaca City, 15-21/VII/1937 (UAIC); 36.6 km N Oaxaca, Hwy 190, 21/V/1973 (USNM); 178 km S Oaxaca, Rte. 131, 7500 ft., 11/V/1971 (CNC). Sinaloa- 38 mi NE Concordia, nr. Loberas, 3/VII/1982 (CDFA); 80 km E Mazatlan, 26/IV/1974, 27/IV/1974 (CASC); 36.6 mi NE Villa Union, nr. La Capilla Detaxte, 2/VII/1982 (CDFA); 44 mi E Villa Union, 11/I/1951 (EGRC). **NICARAGUA:** Chontales (USNM). Total: 218.

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